

ANDREI LUDU

PROFESSOR • RESEARCHER • SCIENTIFIC & ENGINEERING CONSULTANT

Physics, Engineering & Mathematics

Highly knowledgeable and results-oriented Professor with extensive experience in all phases of program development, experimentation, results analysis, and progressive research. Expertise in fundamental and applied science, nonlinear systems, fluid dynamics, nuclear physics, computational biology, and mathematical modeling. Proven ability to consistently demonstrate high levels of initiative and problem-solving skills in complex scientific and engineering environments. Exceptional writer and communicator, innovative scientist, and valuable asset to research and development teams. Proficiencies include:

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|------------------------------|----------------------------|-----------------------------|
| ✓ Scientific Training | ✓ Signal and Data Analysis | ✓ Nonlinear analysis |
| ✓ Research Development | ✓ Computer Modeling | ✓ Military Appl. of Physics |
| ✓ Ocean and Sea-Ice Science | ✓ Nuclear Physics | ✓ Grant Writing |
| ✓ Fluid physics, shock waves | ✓ Wavelets, Fractals | ✓ Technical Documentation |

TEACHING EXPERIENCE

Embry-Riddle Aeronautical University, College Arts and Science 2011–Present

Professor of Mathematics, Director of the Wave Lab

Serving as math professor and key research manager for university. Recruiting students to work along the projects in the new Wave Lab. Develop new science education programs and significantly increase research.

- Founded and built the Nonlinear Wave Lab 2, a 4,200 water gallons facility with 4 wave makers and 12 IR laser for testing models of Rogue waves, tsunamis, AUVs, weather buoys, fish schools, axonemal swimming, etc.
- Published 84 articles, 7 monograph, more than 100 contributions, talks and presentations, 2 invention patents.
- Brought in external grants worth \$1.200,000.

Northwestern State University, Natchitoches, LA 2001–2011

Professor of Physics

Serve as physics professor and key department member for university. Recruit students to revitalize science education programs and significantly increase research and development. Publish advanced articles and textbooks, organize conferences, oversee laboratory research, write grants, and supervise theses (BS, MS, PhD). Integral player in growing NSU by establishing prestigious research programs and raising student interest in physics disciplines.

- Recruited and produced top-performing students, increasing graduation rate from 0.5 to 4-6 students per year.
- Founded successful “Interdisciplinary IDEAS Program.”
- Revamped “Join the Venture” research program.
- Published 15 articles, 1 monograph (475 pages), and 2 custom edition textbooks.
- Brought in external and federal grants worth more than \$200k.

Louisiana State University, Baton Rouge, LA 1996–2001

Senior Postdoctoral Researcher

Supervised 3 doctoral students in research and development in nuclear physics. Produced exciting new fundamental science models for numerous nuclear theories.

- Published top journal article for physicists worldwide in “Physical Review Letters”
- Established “Interdisciplinary Seminar: Physics, Math, Computer Science.”
- Organized numerous international conferences and participated in National Science Foundation Grants.

Bucharest University, Bucharest, Romania 1985–1996

Associate Professor of Physics

- Taught theoretical physics and applied mathematical courses to undergraduate/graduate students. Performed in-depth research in soliton physics.
- Introduced new model of solitons in nuclear physics—now part of new periodic table of elements, confirmed experimentally by nuclear physics labs in Darmstadt, Germany.

RESEARCH EXPERIENCE

US Navy Research Lab., Stennis Space Center, MS Research and Development Consultant	2021–2024
Proctor & Gamble, Cincinnati, OH and Frankfurt/Main, Germany Research and Development Consultant	1995, 2006–2009
Antwerp University–Physics Department, Condensed Matter Theory Group, Belgium Sabbatical	2008
J.W. Goethe University, Frankfurt/Main, Germany Guest Professor	1993–2007
J. Liebig University, Giessen, Germany Guest Professor	1993–2003
Institute of Atomic Physics, Bucharest Researcher	1980–1985

EDUCATION & CERTIFICATION

PhD in Physics: Bucharest University, Institute for Atomic Physics, Romania
Dissertation: Group Methods in Thermonuclear Fusion

MS in Theoretical Physics and Mathematics: Bucharest University, Romania

BS in Theoretical Solid State: Bucharest University, Romania

Certified in Geometry: International Center for Theoretical Physics, Trieste, Italy

SELECTED PUBLICATIONS

7 books and 84 articles in prestigious international journals. [Complete list is here.](#)

- **Nonlinear Waves and Solitons on Contours and Closed Surfaces** 475 pages monograph, Springer-Heidelberg-New York 2012, 2018, 2022.
- **Boundaries of a Complex World**, Springer-Verlag, Heidelberg, 2016, 2022.
- **Periodic Solutions in the Soliton Theory for Nerves**, *Biophysical Chemistry* **153** (2011) 159-167.
- **Nonlinear Schrodinger Equation Solitons on Quantum Droplets**, *Physical Review Research* **3** (2021) 0330543.
- **Experimental study of breathers and rogue waves generated by random waves over non-uniform bathymetry**, *Physics of Fluids* **32**, 8 (2020) 087109, 1-32.
- **Energy Transfer from Wind to Wave Groups: Theory and Experiment**, *Advances and Applications in Fluid Mechanics* **20**, 1 (2017) 21-74.
- **Periodic Solutions in the Soliton Theory for Nerves**, *Biophysical Chem.* **153** (2011) 159-167.
- **Analytic Treatment of Vortex States in Cylindrical Superconductors in Applied Magnetic Field**, *J. Math. Phys.* **51**, 1 (2010) 082903, 1-29.
- **Nonlinear Modes of Liquid Drops as Solitary Waves**, *Phys. Rev. Lett.* **80** (1998) 2125-2128.

PROFESSIONAL AFFILIATIONS & AWARDS

Director IDEAS Program of Interdisciplinary Science at Northwestern State University;

American Physical Society

College of Science and Technology director in the NSU Research Council

Chair of the Enrichment Fund Committee of the NSU Research Council

Member: Editorial Board of Romanian Journal of Physics

Member: International Association of Mathematical Physics

Member: SIAM Activity Group (SIAG) on Nonlinear Waves

International Who's Who of Professionals, Who's Who Historical Society

Recipient of the Exceptional National Grant of Merit, Bucharest University

International Association of Mathematical Physics

Affiliate: Institute of Physics, London, UK

E. P. Wigner International Committee for Mathematical Physics

New York Academy of Sciences, New York, NY

American Association for the Advancement of Science, New York, NY

American Physical Society, New York, NY

Romanian Society of Physics, Bucharest